



MAIL STOP AF  
PATENT  
0543-1015

IN THE U.S. PATENT AND TRADEMARK OFFICE

In re application of

Samuel MARLIN

Conf. 1418

Application No. 10/553,438

Group 1793

Filed October 14, 2005

Examiner Noah Wiese

ALUMINUM- AND MAGNESIUM-BASED MOLTEN CERAMIC GRAINS

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Assistant Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450  
Sir:

August 19, 2008

Applicant requests a pre-appeal brief review of the final rejection in the above-identified application. No amendments are being filed with this request.

A Notice of Appeal is filed herewith.

The review is requested for the reasons advanced on the attached sheets.

Respectfully submitted,

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Applicant respectfully requests a pre-appeal brief review of the final rejection of claims 1-5, 8-9 and 12 as anticipated by Nikitina et al. (US 4,906,255; "NIKITINA") and of the final rejection of claims 10-11 and 23-25 as being obvious over NIKITINA. Applicant respectfully submits that the rejections include at least a clear factual error, or in the alternative, a clear legal error, as explained below.

As to claim 1, it is respectfully submitted that NIKITINA does not teach or suggest the recited requirement of the maximum carbon content being 200 ppm.

The Examiner argues that NIKITINA teaches no addition of carbon to the mixture before arc melting is carried out; therefore, no carbon, or at least not an appreciable amount, would be in the fused grains. The Examiner concludes that the carbon amount would be below 200 ppm and accordingly maintains the rejection of claim 1.

Applicant respectfully disagrees. Although NIKITINA does not explicitly describe the oxidation-reduction conditions in which the abrasive material is produced, NIKITINI refers to the "conventional manner" wherein aluminum oxide is melted in an electric arc furnace with additions containing one or more listed oxides, referring specifically to the reference A.P.Garshin et al., "Abrazivnye materialy", 1983, Mashinostroenie (Leningrad)

(hereinafter, "GARSHIN"; see NIKITINA, column 4, lines 27-31; also, column 2, lines 20-25; column 2, lines 62-63).

Contrary to the Examiner's position that no addition of carbon is taught by NIKITINA, GARSHIN teaches the use of a furnace "fitted with graphitised (sic) electrodes" (GARSHIN page 1, lines 3-4). The carbon in the final product may come from an addition of carbon in the starting charge, and also from the consumption of the graphitized electrodes. Thus, an appreciable amount of carbon to exceed 200 ppm is present in NIKITINA even if no other carbon is added.

GARSHIN also teaches oxidizing conditions. From page 1 to 5 of the translation, GARSHIN describes the melting step to obtain white corundum. It is respectfully submitted that one of skill in the art would readily understand that white corundum is manufactured under oxidizing conditions. The white color of refractory products normally corresponds to oxidizing conditions.

GARSHIN also recites that "the most effective technical solution in order to increase the quality of the final product was found to be processing of the melt stream with compressed air outside the furnace, which ensures homogenisation (sic) of the melt, and an increase in its temperature owing to oxidative processes," (GARSHIN, page 2, last paragraph and page 3, first paragraph). "[A] still higher quality crystallised (sic) product can be ensured by

blowing oxidizing gases through the whole mass of the melt through a bottom of the mould or of an intermediate vessel," (GARSHIN, page 3, first paragraph). These passages of the reference to NIKITINA confirm that oxidation is not only disclosed, but advantageous.

Further, NIKITINA's "conventional manner" disclosed by GARSHIN, describes a melting step wherein the melting energy is "within the range 1200 to 1300 kWh/ton of fragments," (GARSHIN page 1, third paragraph, line 2). One of skill would not expect that with such a low melting energy as described by GARSHIN that NIKITINA could reach a carbon content less than 200 ppm, especially if reducing conditions are further disclosed. This is in stark contrast to the claimed invention requiring melting energy "between 2000 and 2500 kWh per ton of said mixture of raw materials" (specification, page 3, lines 22-23; see also claim 13).

Therefore, it is respectfully submitted that NIKITINA fails to teach or suggest a carbon content being 200 ppm as required by claim 1. NIKITINA, by reference to GARSHIN, at least teaches a source of carbon by way of the graphitized electrodes, and the carbon content in the final product is therefore higher than 200 ppm as a result of the oxidizing conditions disclosed in GARSHIN as explained above. GARSHIN's description favoring oxidizing conditions teaches one of skill away from the claimed invention.

Accordingly, it is respectfully submitted that the rejection of claim 1 is inappropriate. Claim 25, which also recites a carbon content being 200 ppm, is also submitted as patentable at least for the same reasons set forth above as to claim 1, and claims depending from claim 1 are patentable at least for depending from a patentable claim.

In addition, it is respectfully submitted that the Examiner's rejection of claim 9 is in error. NIKITINA does not teach or suggest grains which consist of corundum crystals surrounded by a nonstoichiometric MgO-Al<sub>2</sub>O<sub>3</sub> spinel phase.

The Examiner acknowledges that NIKITINA is silent to the stoichiometry or nonstoichiometry of the spinel phase, but asserts that NIKITINA would be inherently at least partially nonstoichiometric.

Respectfully, this does not teach what is claimed. That is, claim 9 does not recite grains which comprise corundum crystals surrounded by a nonstoichiometric MgO-Al<sub>2</sub>O<sub>3</sub> spinel phase. Claim 9 requires grains which consist of corundum crystals surrounded by a nonstoichiometric MgO-Al<sub>2</sub>O<sub>3</sub> spinel phase. In other words, claim 9 relates to a structure wherein the spinel phase is substantially completely nonstoichiometric.

The teaching of only partially nonstoichiometric, inherent or express, does not anticipate claim 9. It is

therefore respectfully submitted that claim 9 is novel and non-obvious over NIKITINA.

Further as to claims 10, 11, and 23-25, it is respectfully submitted that it would not have been obvious to one of ordinary skill in the art, through "ordinary experimentation and optimization", to arrive at the recited material based on the disclosure offered in part by the Examiner to anticipate claim 1: NIKITINA page 5, Table 1, composition 10.

On the contrary, NIKITINA clearly teaches composition 10 of Table 1 as disadvantageous where "the abrasiveness of the grain decreases considerably," (column 6, lines 1-2). The composition as recited in the present invention would be unexpected to one of skill based on the whole of NIKITINA which teaches away from the composition of example 10, thereby discouraging experimentation on this composition.

Accordingly, it is respectfully submitted that the invention claims 10, 11, and 23-25, in addition to the reasons set forth above as to claim 1, are non-obvious over NIKITINA.

#### CONCLUSION

Based on the above-identified errors, it is respectfully submitted that the rejection of Applicant's claims 1-5, 8-12, and 23-25 be withdrawn.